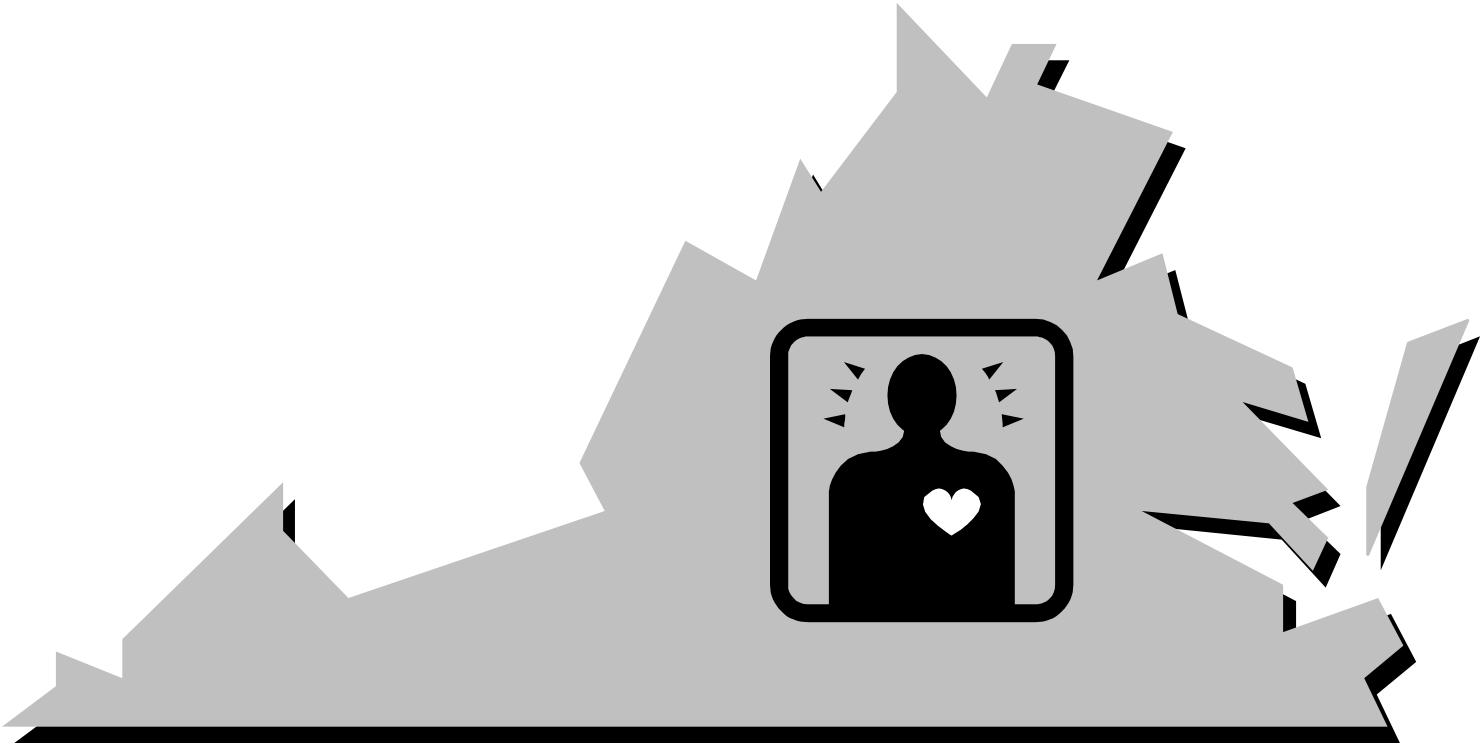
Cardiovascular Disease In Virginia

A Report from the Virginia Cardiovascular Health Project

Date: June 2005



VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment
www.vdh.virginia.gov

Chronic Disease Prevention
Division of Chronic Disease Prevention and Control
www.vdh.virginia.gov
You CAN

Cardiovascular Disease (CVD) in Virginia

A Report from the Virginia Cardiovascular Health Project

Table of Contents

The purpose of this report is to present the current status of Virginia cardiovascular disease (CVD) mortality, CVD hospitalizations with an estimate of associated charges, and the prevalence of CVD risk factors.

Prepared by:

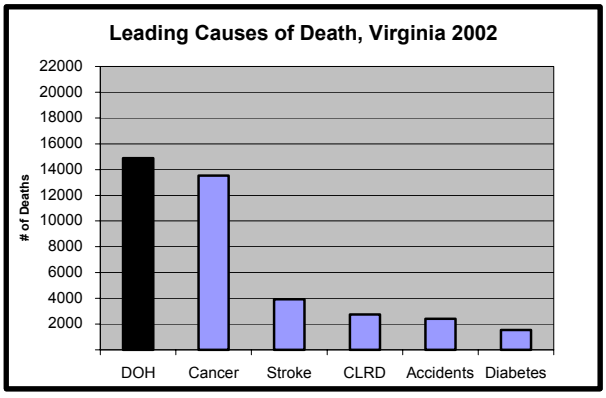
Stephanie Gruss, *Epidemiologist, Cardiovascular Health Project (CVHP), Virginia Department of Health*

Barbara Mueller, *Secondary Prevention Specialist, CVHP, Virginia Department of Health*

Suzanne Adamsky, *Consultant, Keane, Inc.*

Burden Summary

How serious is the problem?
Cardiovascular Diseases (CVD), including diseases of the heart and stroke, are the number one killers of Virginians and accounted for 35% of all Virginia deaths in 2002.



How much does it cost?
The hardships associated with CVD and death come at an astounding cost. Based on 2002 Virginia Health Information data, there were 126,682 hospital admissions attributable to CVD as a primary diagnosis. The total charge for CVD admissions was over $2.5 billion, averaging $19,734 per admission. Over the next five years, if admissions for CVD were reduced by just 5%, the savings in 2007 dollars would be approximately $750 million.

Who is at risk?
CVD is often thought to primarily affect men and older people, but it is a major killer of people in the prime of life and more than half of all CVD deaths each year occur among women. Blacks are more adversely affected by heart disease and stroke than any other minority population in Virginia. Risk factors for CVD include sedentary lifestyle, poor nutrition, poor diabetes management, high blood pressure and cholesterol, and overweight or obesity – anyone who participates in these lifestyle behaviors could be at risk for developing CVD. Based on Behavioral Risk Factor Surveillance Survey (BRFSS) data analyses, the risk to Virginians is considerable. In 2002, survey respondents provided the following information:

- 3% had been told by a doctor that they had a heart attack or myocardial infarction.
- 2% had been told by a doctor that they had a stroke.
- Nearly 4% had been told by a doctor that they had angina or chronic heart disease.
- 25% had been told by a doctor or a health care professional that they have high blood pressure.
- 33.6% had been told by a doctor or a health care professional have high blood cholesterol.
- Over 72% did not eat five or more servings of fruits and vegetables a day.
- 24% had not participated in any leisure time exercise or physical activity during the past month.
- 35.1% of Virginia adults were overweight and 23.7% were obese based on reported height and weight, according to national guidelines.
- Nearly 25% had smoked at least 100 cigarettes in their lifetime and may currently smoke.

What can be done?
The Cardiovascular Health Project (CVHP) is focused on increasing environmental, social, and policy support for cardiovascular health. The core project components include:

- Increasing the capacity to plan, implement, track, and sustain population-based interventions to address heart disease, stroke, and related risk factors (i.e. high blood pressure, high blood cholesterol, tobacco use, physical inactivity, and poor nutrition).
- Promoting secondary CVD prevention in a variety of settings (health care, worksite, schools, and community) through education, policy and environmental changes.
- Identifying promising practices to promote heart-healthy interventions, particularly to prevent first and second CVD events.
- Conducting surveillance of CVD and related risk factors and assessment of policy and environmental support for heart disease and stroke prevention.

For additional Cardiovascular Health Project information, contact:

- Project Manager, Cardiovascular Health Project
  Virginia Department of Health
  109 Governor St., 10th Floor
  Richmond, VA 23219
  (804) 864-7877

Virginia Cardiovascular Health Project

Among men and women and across all racial and ethnic groups, cardiovascular diseases are our nation's leading killers.

To address the serious need for national cardiovascular health awareness and improvement, the Centers for Disease Control and Prevention (CDC) received federal funding in 1998 for states to develop comprehensive cardiovascular health programs. The Virginia Department of Health partnered with the CDC in 1999 to form the Cardiovascular Health Project (CVHP). CVHP seeks to lessen the burden of cardiovascular disease (CVD) and improve the cardiovascular health of Virginians by encouraging education, policy and environmental changes that promote heart health throughout the state. Specific program goals include:

- Implement population-based interventions including strategies addressing priority populations: The CVHP will address risk factors for CVD and priority populations using multilevel strategies as its theory of action.
- Implement professional education initiatives that expand the number of health care professionals who offer preventive services and counseling as part of appropriate standards of care: The CVHP will implement CVD secondary prevention initiatives through key partnerships and health care networks.
- Monitor CVD secondary prevention activities: Activities related to CVD practices and guidelines will be monitored through accessing currently available data sources.
- Monitor surveillance data regarding the burden of CVD for Virginia, including priority populations: The CVHP will update the full CVD burden report to include current mortality data, hospital discharge data, Behavioral Risk Factor Surveillance Survey data, and data on priority populations.
- Evaluate key components of the CVHP interventions: The evaluation plan monitors progress toward meeting specific project objectives and timelines by assessing the impact of the program on the general population, assessing changes in priority populations, monitoring the use of secondary prevention strategies, and assessing the implementation of policy, social and environmental strategies. Contracts have been established to help evaluate particular interventions within the work plan, such as the Community Health Centers' secondary prevention professional education initiatives and to assist the Centers with implementation and spread of the Chronic Care Model Collaboratives, the analysis and compilation of environmental and policy data, and other key initiatives.

Other State CVD-focused Activities

- Updating the State Cardiovascular Disease Risk Reduction Plan entitled "Virginia's Plan for the Prevention of Cardiovascular Disease 1998-2010"
- Coordinating the statewide cardiovascular health coalition "Healthy Pathways"
- Updating the state cardiovascular disease data report
- Maintaining a Cholesterol Standardization Program and the Blood Pressure Quality Assurance Program
- Providing resources, professional education, training and technical assistance on cardiovascular health issues

Partnerships

Partnerships are integral to every objective within the CVHP comprehensive work plan. The scope and breadth of the program could not be accomplished without the direct involvement of partnerships that affect community, worksite, health care, school, and faith organizations. The CVHP's relationship with the local health districts is vital to the success of implementing secondary prevention at the community level. These districts will also implement school, community, faith, health care, and worksite interventions. The faith organization partnership will give the CVHP direct access to priority populations through congregates' involvement in CVH promotional efforts.

Key partners have been incorporated into interventions to affect change in the health care systems such as the Virginia Health Quality Center (the State's hospital quality improvement organization), Anthem Blue Cross Blue Shield, Sentara Healthcare Systems, the Community Health Centers' secondary prevention data and efforts to incorporate Health Resources and Services Administration's Collaboratives into the system, the Virginia Diabetes Council and state program, and companies providing

pharmaceutical record reviews for physician practice patterns for CVD-related risk reduction prescriptions.

Partnering is essential to access surveillance data systems such as with the Virginia Center for Health Statistics (mortality data), the Virginia Hospital Information, Inc.'s (hospital discharge data), and Virginia Commonwealth University's Survey and Evaluation Research Laboratory for BRFSS data.

Racial and Ethnic Disparities

The CVHP recognizes the need to address racial and ethnic disparities related to cardiovascular health promotion and CVD risk reduction. The CVD minority data in Virginia is particularly devastating for the African-American community. CVHP is addressing this need through community and faith organization program goals focused on minority and underserved communities. Planned partnerships with the Office of Minority Health, the faith organization state leaders, the Community Health Centers, managed care organizations, WIC, the Department of Medical Assistance Services, and other key partners will reduce statewide disparities.

Innovative Approaches

The Healthy Pathways Coalition is a key partner to the CVHP. The Coalition is comprised of representatives from businesses, health professional organizations, hospitals, medical professionals, health educators, parish nurses, pharmaceutical companies, transportation experts, housing and development authorities, restaurant and grocery groups, managed care, media, Virginia Department of Education, universities, community members, and other members concerned about the cardiovascular health of Virginians. This coalition focuses on increasing the number of strategies in place in Virginia that promote an increase in knowledge of the signs and symptoms of heart disease and stroke, the importance of a timely 9-1-1 system and the standardization of hospital guidelines for treatment of heart disease and stroke.

The Healthy Pathways Coalition's goals include expanding the diversity of its membership and increasing its visibility. The coalition will complete a detailed "Call to Action Plan" for the existing state CVD Risk Reduction Plan that will include prioritized strategies on secondary prevention and environmental and policy strategies for community, school, worksite, health care, and faith organization settings.

Resources

To view the Virginia Cardiovascular Health Project web pages, see http://www.vahealth.org/cvd/index.htm.

The following web sites provide additional state and national resources for cardiovascular health information:

- Centers for Disease Control and Prevention (CDC) Heart and Stroke Prevention Program: http://www.cdc.gov.cvh
- American Heart Association: http://www.americanheart.org
- Behavioral Risk Factor Surveillance System (BRFSS): http://www.cdc.gov/brfss
- Virginia Diabetes Control Project: http://www.vahealth.org/diabetes/
- Healthy People 2010: http://www.healthypeople.gov/
- Virginia Health Information (VHI): http://www.vhi.org
- Virginia Center for Health Statistics: http://www.vdh.state.va.us/healthstats/

Virginia Demographics

In 2000, as per the U.S. Census, Virginia was ranked as the 12th most populated state with 7,078,515 residents. More than three-fourths of the state population lives within metropolitan areas.

The state consists of 135 localities, including 95 counties and 45 independent cities. Localities are grouped into 35 health districts and five health-planning regions. Twenty-five of 135 localities have population densities of less than 50 persons per square mile. Half of Virginia localities have total populations under 20,000 persons, with 24 of those having less than 10,00 persons.

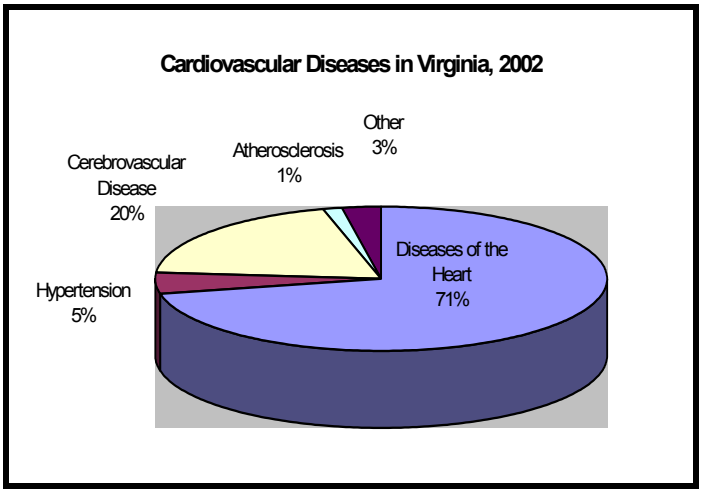
	Virginia	USA
Population, 2003 estimate	7,386,330	290,809,777
Population % change, April 1, 2000-July1, 2003	4.3%	3.3%
Population, 2000	7,078,515	281,421,906
Population, % change, 1990-2000	14.4%	13.1%
Persons under 5 years old, %, 2000	6.5%	6.8%
Persons under 18 years old, %, 2000	24.6%	25.7%
Persons 65 years old and over, %, 2000	11.2%	12.4%
Female persons, %, 2000	51.0%	50.9%
White persons, %, 2000 (a)	72.3%	75.1%
Black or African American Persons, %, 2000 (a)	19.6%	12.3%
American Indian and Alaska Native persons, %, 2000 (a)	0.3%	0.9%
Asian persons, %, 2000 (a)	3.7%	3.6%
Native Hawaiian and Other Pacific Islander, %, 2000 (a)	0.1%	0.1%
Persons reporting some other race, %, 2000 (a)	2.0%	5.5%
Persons reporting two or more races, %, 2000	2.0%	2.4%
Persons of Hispanic or Latin origin, %, 2000 (b)	4.7%	12.5%
White persons, not of Hispanic/Latino origin, %, 2000	70.2%	69.1%
Living in same house in 1995 and 2000, % age 5+, 2000	52.2%	54.1%
Foreign born persons, %, 2000	8.1%	11.1%
Language other than English spoken at home, % age 5+, 2000	11.1%	17.9%
High school graduates, % of persons age 25+, 2000	81.5%	80.4%
Bachelor's degree or higher, % of persons age 25+, 2000	29.5%	24.4%
Persons with a disability, % age 5+, 2000	1,155,083	49,746,248
Mean travel time to work, workers age 16+ (minutes), 2000	27	25.5
Housing units, 2002	3,006,877	119,302,132
Homeownership rate, 2000	68.1%	66.2%
Housing units in multi-unit structures, %, 2000	21.5%	26.4%
Median value of owner-occupied housing units, 2000	$125,400	$119,600
Households, 2000	2,699,173	105,480,101
Persons per household, 2000	2.54	2.59
Median household money income, 1999	$46,677	$41,994
Per capita money income, 1999	$23,975	$21,587
Persons below poverty, %, 1999	9.6%	12.4%

*From the 2000 U.S. Census Bureau State and County QuickFacts (http://quickfacts.census.gov/qfd/states/00000.html): a. Includes persons reporting only one race, b.Hispanics may be of any race, so also are included in applicable race categories

Cardiovascular Disease in Virginia

In 2002, deaths due to major cardiovascular disease accounted for 20,126 (35%) of 56,952 total deaths in Virginia.

Cardiovascular disease (CVD) is not a single disease, but a category of disorders affecting the heart and blood vessels - coronary heart disease, cerebrovascular disease (stroke), atherosclerosis, congenital heart disease, and hypertension are all forms of cardiovascular disease.

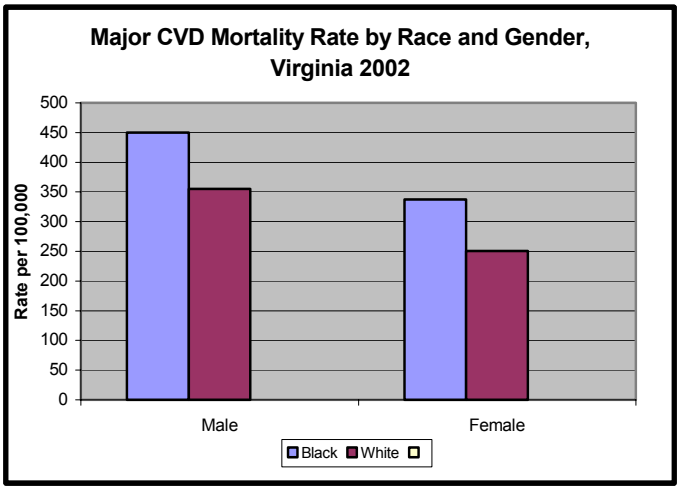


From 1991-2002, there has been a 20% CVD age-adjusted death rate decline in Virginia, which is largely attributable to changes in personal health behaviors and improvements in medical technology. The actual number of deaths between 1991 and 2002 has *increased* slightly (.4%), but the Virginia population has also increased to produce an improved death rate.

Despite the declines in mortality rate, the toll from CVD mortality is high. CVD claims more lives each year than the next four leading causes of death combined - cancer, chronic lower respiratory diseases, accidents, and diabetes mellitus. Females have the highest mortality rates in the state. This is comparable to U.S. statistics. Where, in 2001, 700,142 people died of heart disease, 52% were female and 48% were male.

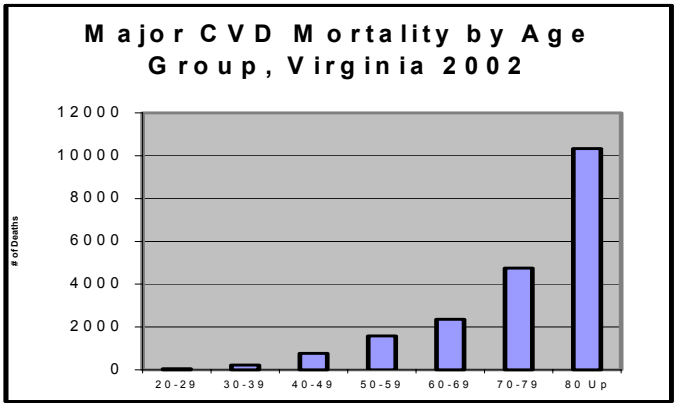
In Virginia, 2002:

- The overall age-adjusted death rate from CVD was 306.8 deaths per 100,000 population, and the age-adjusted rate was 225.8 for diseases of the heart and 60.9 for stroke.
- The age-adjusted death rate per 100,000 population was 263.0 for females and 365.5 for males.
- The age-adjusted death rate per 100,000 population was 295.3 for whites and 384.4 for blacks.



Many people believe that heart disease and stroke primarily affect men and older people, but they are the leading causes of death for both men and women. More women than men die each year from CVD in Virginia, and, although there is an overall mortality rate decline, the decline is significantly less for women.

Also, CVD is more common among people aged 65 years and older, but the number of sudden deaths from heart disease among people aged 15–34 has increased.



In Virginia, 2002:

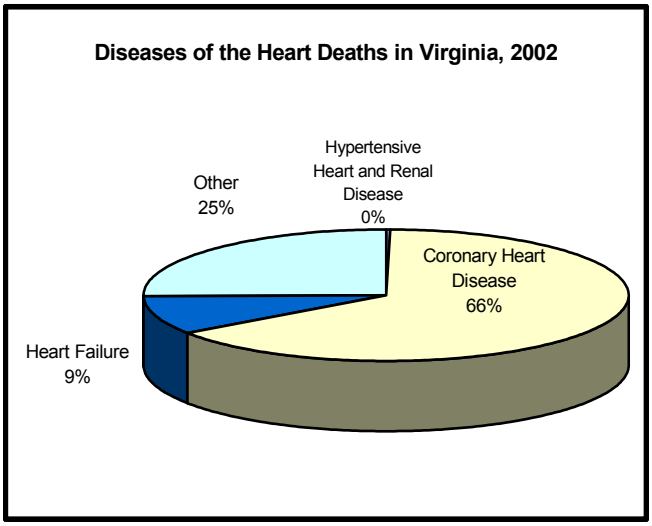
- Over 3,600 people who died from CVD were under the age of 65.
- Almost 39% of deaths from CVD occurred prematurely, or before age 77.4, the average life expectancy in 2002.

Additionally, deaths related to diabetes, a significant risk factor for CVD, are increasing. In Virginia in 2002, about 10% of all CVD deaths were to people with diabetes. Although there has been a national decline in CVD mortality, deaths from heart disease in women with diabetes have *increased* 23% over the past 30 years compared to a 27% *decrease* in women without diabetes. Deaths from heart disease in men with diabetes have decreased by only 13% compared to a 36% decrease in men without diabetes.[1]

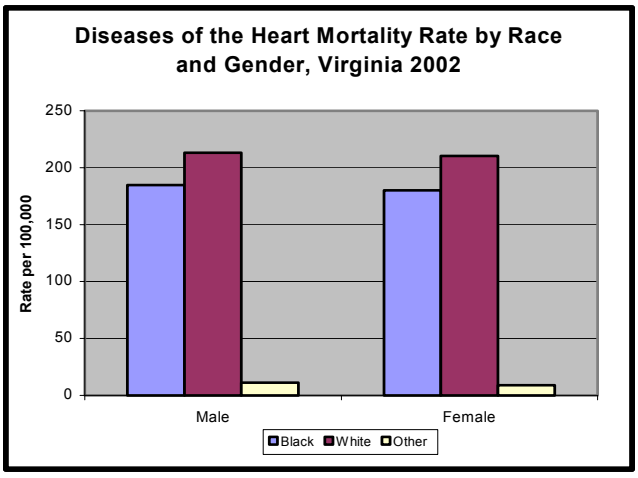
Diseases of the Heart

"Diseases of the heart" are the leading cause of death in Virginia.

Diseases of the heart accounted for 14,881 deaths in Virginia in 2002 - 26% of total deaths in the state. Of those deaths, the majority (9,534) was due to ischemic heart disease. However, diseases of the heart include several diseases, such as ischemic or coronary heart disease, rheumatic heart disease, hypertensive heart disease, pulmonary heart disease, dysrhythmias, heart failure, and other causes.

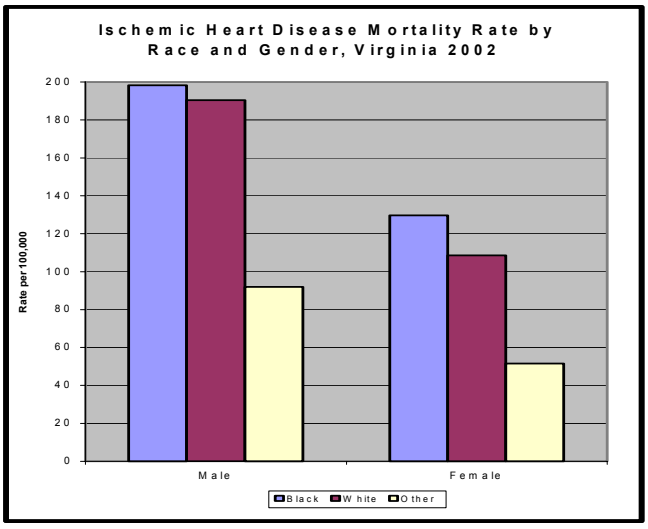


Three health-related behaviors - tobacco use, lack of physical activity, and poor nutrition - contribute markedly to heart disease. Modest changes in one or more of these risk factors among the population can have a large public health impact. Heart disease can also be prevented or controlled by changing governmental policies (such as restricting access to tobacco), and by changing environmental factors (such as providing better access to healthy foods and opportunities for physical activity).

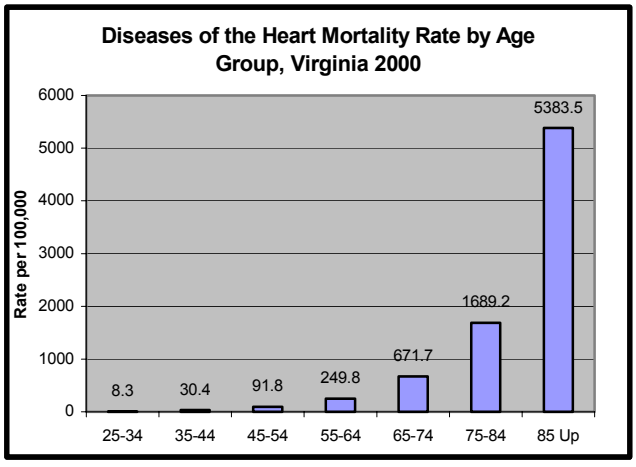


For ischemic heart disease in Virginia, 2002:

- The death rate per 100,000 was 143.5 for whites, 158.6 for blacks, and 67.8 for other racial/ethnic categories.



- In Virginia in 2000, the age-adjusted mortality rates more than tripled between the age groups of 25-34 (8.3), 35-44 (30.4), and 45-54 (91.8).

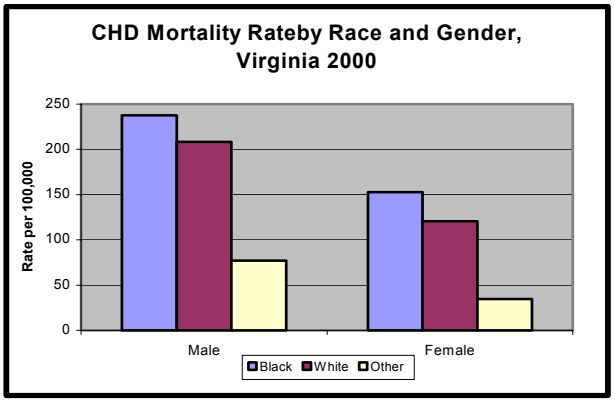


Coronary Heart Disease

More than 12 million Americans suffer from coronary heart disease - it is the No. 1 killer of adult Americans.

Coronary heart disease (CHD) is a disease of the heart that affects the arterial blood vessels responsible for delivering blood, oxygen, and other nutrients to the heart muscle. It is categorized by angina pectoris (chest pain) and acute myocardial infarction (heart attack). Although the national CHD death rate has fallen by 40% over the past 20 years - due in part to healthier diets, more regular exercise and advances in medical care - one in ten women aged 45 to 64 has some form of heart disease. The rate increases to one in five for women 65 years of age and older. Modifiable risk factors for CHD include high blood pressure, elevated blood cholesterol, tobacco use, insufficient physical activity, poor nutrition, and environmental tobacco smoke. CHD is largely preventable with changes in lifestyle behaviors, early detection, and treatment.

In 2002, CHD accounted for 9,034 deaths in Virginia, which was 45% of all CVD deaths for that year.



Stroke

Stroke is the leading cause of disability and the third leading cause of death in the United States.

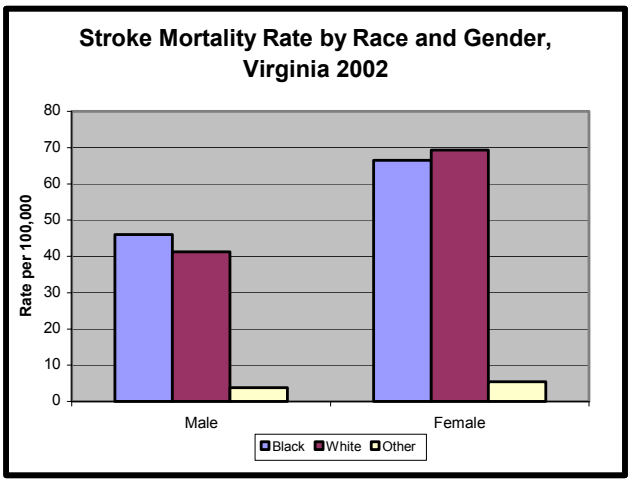
Cerebrovascular disease, or stroke, occurs when blood flow to the brain is restricted or a blood vessel in the brain ruptures, causing ischemic or hemorrhagic stroke. Stroke strikes an estimated 600,000 Americans each year and accounted for about one of every 14 deaths in the United States in 2000. About 50% of these deaths occurred out of hospital.

Although stroke occurs with equal frequency in both men and women, women are more likely to have a stroke at a younger age (40s or 50s) and are more likely to die from stroke. Nationally, women account for more than 60% of the annual deaths due to stroke, making it the second leading cause of death among American women.

The fluctuating death rate in Virginia indicates that although the rates may improve one year there can be a quick decline the following year.

In Virginia, 2002:

- Stroke was the third leading cause of death (3,938 of 56,952) and accounted for 19.6% of all CVD deaths.
- Males had a slightly higher age-adjusted death rate for stroke compared to females– 61.8 per 100,000 population for males, compared to 60.2 for females.
- The greatest increase in stroke mortality rate (400%) is between the 25-34 and 35-44 age groups.
- Black males and females had higher age-adjusted stroke death rates than their white counterparts- 85.2 per 100,000 population for black males, 79.7 for black females, 57.9 for white males and 56.2 for white females.



Diabetes

In 2002, more diabetes-related deaths in Virginia were due directly to major cardiovascular disease than were due directly to diabetes.[2]

Diabetes mellitus is an independent risk factor for several forms of CVD in both men and women, such as coronary heart disease, stroke, peripheral arterial disease, cardiomyopathy, and congestive heart failure.

Cardiovascular complications contribute dramatically to national diabetes morbidity:[1]

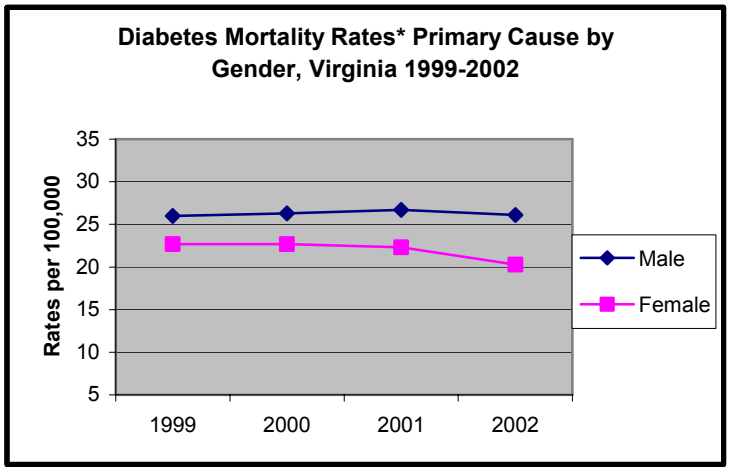
- CVD poses the greatest threat to people with diabetes, killing 75% of all persons with diabetes.
- People with diabetes are two to four times more likely to have a stroke or heart attack than are people without diabetes.
- People with diabetes often experience painless heart attacks that are harder to diagnose and more likely to be fatal, because diabetes causes severe nerve damage to the heart.
- People with diabetes are more likely to die from a second heart attack and are more likely than those without the disease to have a second cardiovascular event.
- CVD is the most serious complication of Type 2 diabetes, causing two out of three diabetes-related deaths.

From 1996-2002 in Virginia, the diabetes mortality rate gradually but steadily increased. Of the deaths related to diabetes each year in Virginia:[3]

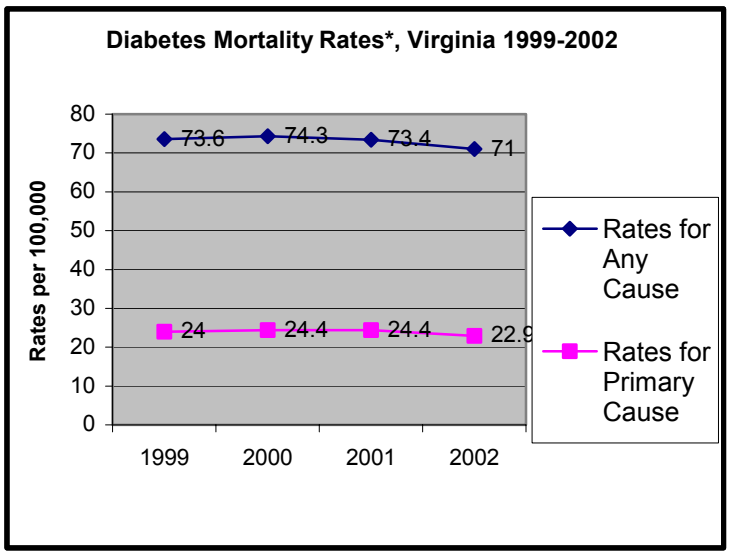
- Less than one-third were due to diabetes as a primary cause.
- More than two-thirds were due to diabetes as a secondary or contributing cause.
- Rates were significantly higher among blacks than whites at every age group.

In Virginia, in 2002:

- Age-adjusted rates were higher in males at 83.1 per 100,000 than females at 62.5 and increased exponentially with age.
- Black males had an age-adjusted death rate per 100,00 of 144.8, black females had a death rate of126.7, white males had a death rate of 73.4, and white females had a death rate of 50.7.



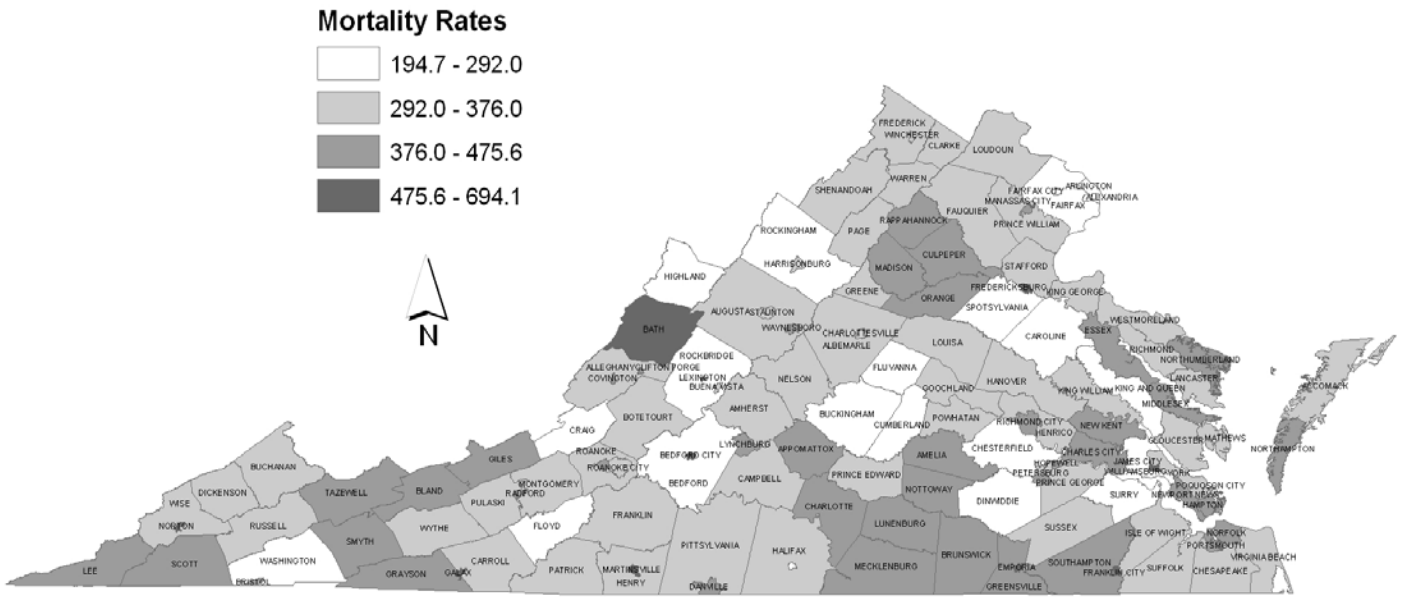
*Age-Adjusted



*Age-Adjusted

Virginia 2001 CVD Mortality Rates by County

per 100,000

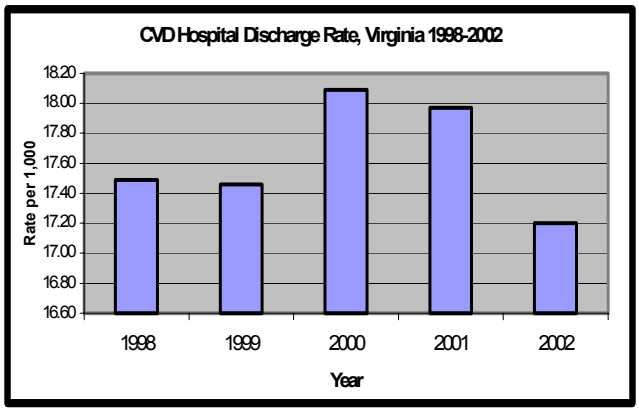


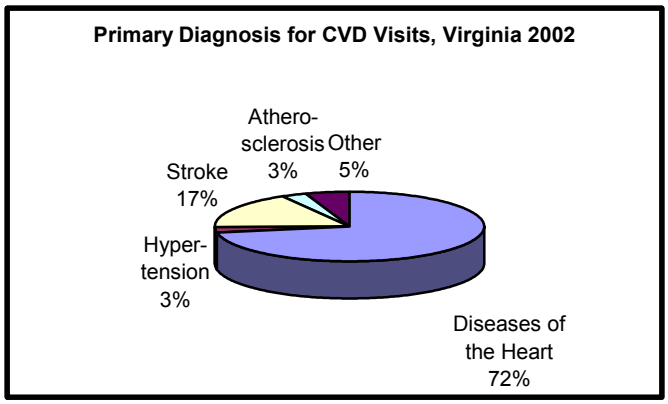
Economic Burden

VD is not only a considerable health burden it is also a significant economic burden that will continue to grow as the population ages. In the United States, the estimated annual cost of CVD is nearly $300 billion or $1,100 per person. This figure includes direct costs of health expenditures (60%) and indirect costs of lost productivity resulting from illness and death (40%). The majority of the cost for CVD is for inpatient hospitalizations; the use of expensive treatment, while often effective in delaying death from CVD, is likely to continue to increase the financial impact. Disability and compromised quality of life from CVD events also create economic burden. About 57 million Americans (almost 25% of the U.S. population) live with some form of CVD - more than 9 million Americans aged 65 or older report disabilities caused by heart disease. Stroke is also a leading cause of disability in the U.S., affecting 500,000 people each year.

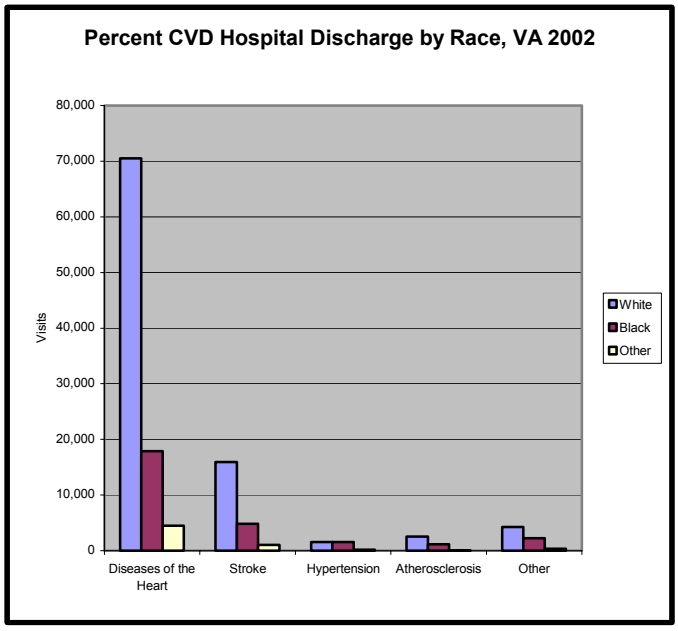
Virginia Health Information, Inc. (VHI) collects statewide hospital discharge data for all primary and eight secondary diagnostic codes in Virginia. According to 2002 VHI data:

- The total charge for CVD discharges was $2,546,432,363, averaging $19,734 per admission.
- There were 126,682 primary CVD hospital visits – almost 20% of total Virginia hospital visits for any reason.
- 72% of all CVD discharges were due to disease of the heart and 17% were due to stroke.
- In 2001, over 65% of hospitalized CVD patients had Medicare as their expected payer and 27% were billed to private insurance.

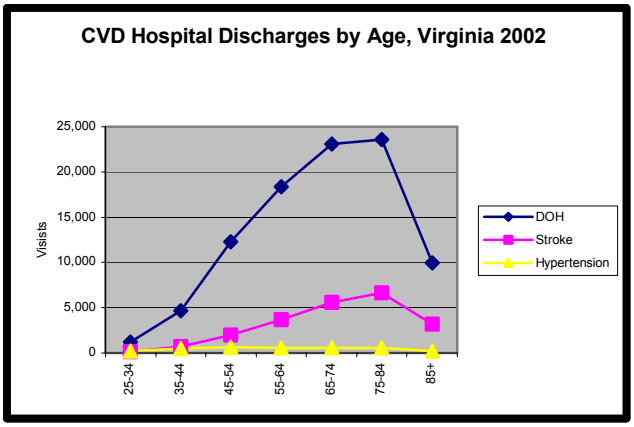




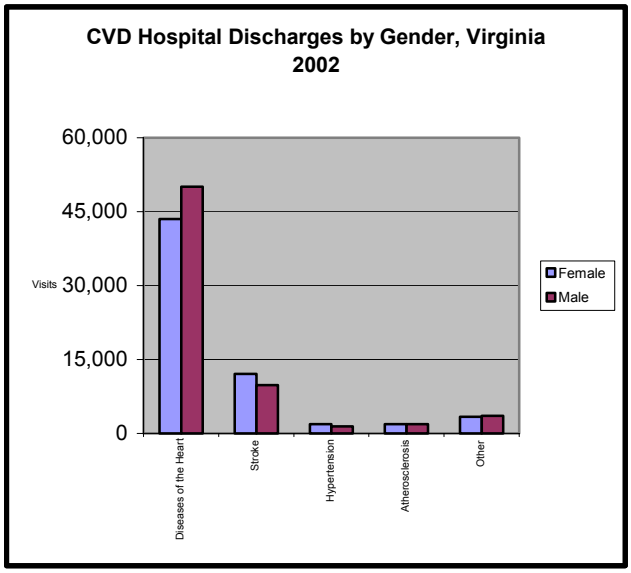
In Virginia, in 2002, whites accounted for 74% of all CVD hospital visits. Blacks accounted for 21% of all CVD visits. Black hospitalizations exceeded whites for hypertension. Asians and Hispanics attributed to less than 2% of CVD visits combined.



Thirty-three percent of all discharged CVD patients were under the age of 65. The number of hospitalizations increased 63% *between the 45-54 and 55-64 age groups*. The most dramatic increase for patients aged 25 to 74 occurred in diseases of the heart hospitalizations.



In 2002, females accounted for 52% of all CVD hospital visits and males accounted for 48%, but males had the majority of diseases of the heart (53%) and atherosclerosis (51%) visits.



CVD patients continue to incur significant inpatient care costs beyond their initial hospitalization. Of the 127,167 people who visited Virginia hospitals in 2001 for CVD-related illness, *over 97,000* required some form of post-hospital care in their homes, a different hospital, a skilled nursing facility or an interim care facility:

- 75, 479 were Home Under Care
- 21,925 were Transferred to Another Facility
- 10,783 were Home Under Self-Care

Years of Potential Life Lost (YPLL) is a measure of premature mortality. Premature mortality can directly affect future earnings due to lost productivity. In 1998, CVD in Virginia ranked third (14.2%) in YPLL prior to age 65 and second (18.1%) prior to age 75. This ranking reflects the large number of people who die prematurely from coronary heart disease. Other categories of CVD accounting for YPLL are acute rheumatic fever, chronic rheumatic heart disease, hypertensive disease, diseases of pulmonary circulation, and other forms of heart disease.

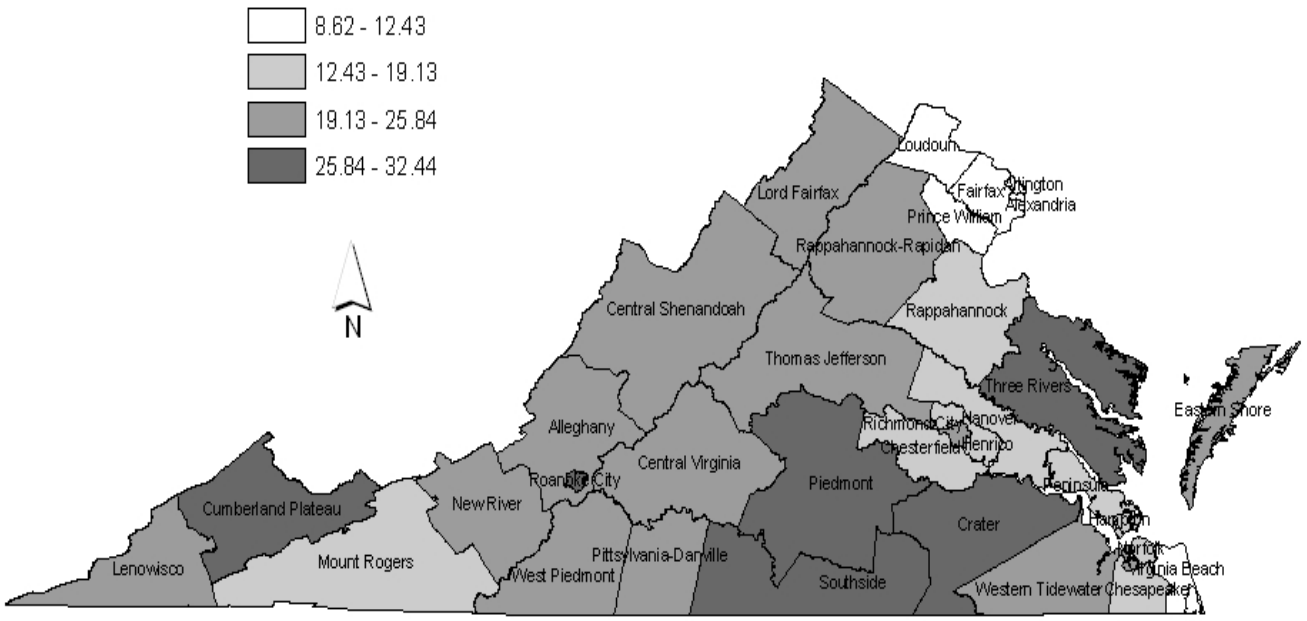
Diabetes Hospital Admissions and Mortality

Diabetes is an independent risk factor for coronary heart disease, stroke, peripheral arterial disease, and congestive heart failure, and contributes dramatically to CVD hospitalizations in Virginia and CVD-related mortality. In 2002:[3]

- Persons with diabetes were responsible for 29.53% of all CVD hospital visits.
- Regardless of gender, people with diabetes were nearly eight times more likely than people without diabetes to be hospitalized for a major CVD event.
- About 10% of all CVD deaths in Virginia were to people with diabetes; this accounts for about 75% of all diabetes-coded deaths.
- The risk of a person with diabetes, aged 20-34 years, for being hospitalized with CVD was more than 11 times as great as the risk for a person without diabetes of the same age.

Virginia 2001 CVD Hospital Discharge Rates by Health District

per 100,000

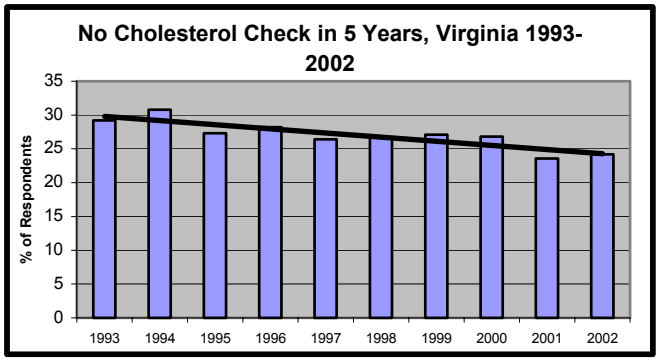


Risk factors are health-damaging behaviors that increase the risk of developing heart disease and stroke. Two of the major independent risk factors for cardiovascular disease are high blood pressure and high blood cholesterol. Using tobacco also directly affects a person's risk for heart disease and stroke, and poor nutrition and physical inactivity increase risk by adversely affecting blood pressure and blood cholesterol levels.

The Virginia Department of Health annually collects self-reported information on approximately 4,300 Virginians' behavior through the Behavioral Risk Factor Surveillance Survey (BRFSS). The BRFSS is an on-going, state-based telephone surveillance system supported by the CDC. Through a series of monthly telephone interviews conducted, Virginia uniformly collects data on the behaviors and conditions that place adults at risk for the chronic diseases, injuries, and preventable infectious diseases that are the leading causes of morbidity and mortality in the United States.

High Cholesterol and Lipids

The risk of coronary heart disease rises as blood cholesterol levels increase. Over one half of adult Americans have cholesterol levels above the desired 200 mg/dL. When other risk factors such as high blood pressure, cigarette smoke, and unhealthy diet are present, the risk increases even more. High blood cholesterol levels can be identified with regular screening. The National Cholesterol Education Program recommends having blood cholesterol levels checked every 5 years for persons over 20 years of age.



According to 2002 BRFSS data, Virginia adults reported the following:

- 33.6% of adult respondents reported being told by a doctor or health care professional that they had high blood cholesterol.
- The reported rate of high blood cholesterol increased with increasing age: 5.2% in the 18-24 year age group to 50.1% in the 65 plus age group.
- The rates were slightly higher for males (35.1%) than females (32.3%).
- The rate was higher among whites (34.6%) than blacks (27.4%).
- The rates decreased with increasing levels of education: 45.6% among those with less than a high school education, 30.7% among those with a post-high school education, and 31.2% among those with a college education.
- The rates decreased with increasing annual income, from 39.5% among those in the <$15,000 group to 30.9% in the $50,000 plus group.

Blood Pressure

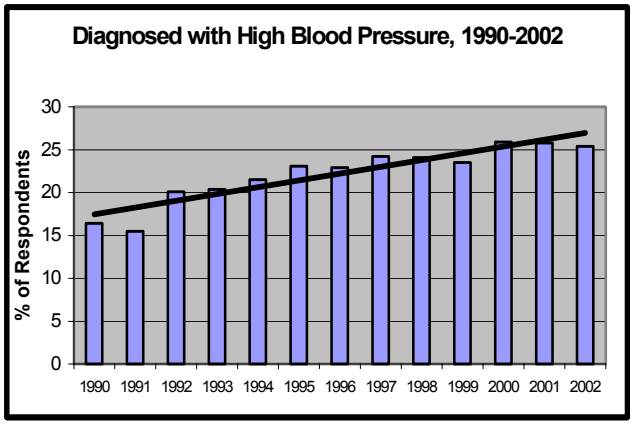
High blood pressure increases the risk of stroke, heart attack, kidney failure, and congestive heart failure. When high blood pressure exists with obesity, smoking, high blood cholesterol levels or diabetes, the risk of heart attack or stroke increases several times. High blood pressure is easily detectable and usually controllable with lifestyle modifications (such as exercise, reducing salt intake, stopping smoking, and weight loss) and/or medication.

The rate of diagnosed high blood pressure in Virginia has increased nearly 40% since 1990. BRFSS data for 2002 show that:

- 25.4% of Virginia adults reported that a doctor or a health care professional had told them that they had high blood pressure.
- The rate of diagnosed hypertension was higher among females (26.6%) than among males (24.3%).
- The rate was higher among blacks (31.5%) than among whites (24.5%).
- High blood pressure increased with increasing age, from 5.7% among 18-24 year olds to 52.9% among those 65 years and older.
- The rate decreased with increasing education level from 41.5% among those

with less than a high school education to 19.6% among those with a college education.

- The prevalence of high blood pressure decreased with increasing annual household income, from 34.8% among those in the <$15,000 group to 21.8% in the highest income group.

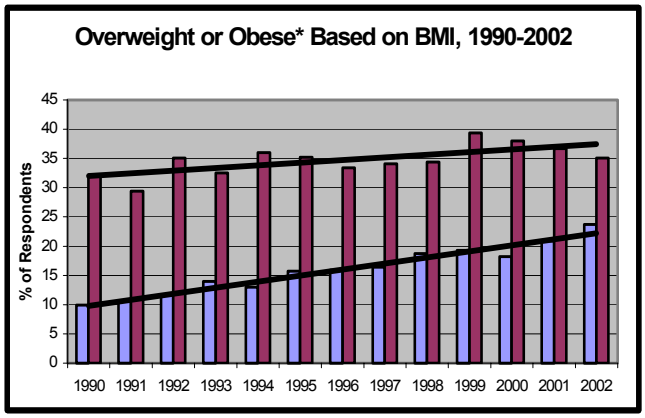


Overweight and Obesity

People with excess body fat are at higher risk for heart disease and stroke – even if no other risk factors are present. Overweight and obese individuals are also more likely to have additional risk factors related to heart disease, specifically hypertension, high blood sugar levels, high cholesterol, high triglycerides, and diabetes.

Virginia BRFSS data show that Virginians are continuing to gain weight at unhealthy levels. Although the number of *overweight Virginians has decreased since 1999, *obesity numbers have increased. In Virginia, in 2002:

- 58.8% of Virginia respondents were either overweight (35.1%) or obese (23.7%) according to national guidelines.
- The obesity rates increased from 8.0% in the 18-24 year age group to 29.4% in the 45-54 year age group then decreased to 19.7% in the 65 plus year age group.
- The rate for males (25.0%) was higher than that of females (22.5%).
- The rate for blacks (34.0%) was higher than that of whites (22.4%).
- Rates decreased with increasing education level, from 30.9% among those with less than a high school education to 20.6% among those with a college education.
- Rates decreased across the annual income categories from 29.7% among those in the <$15,000 group to 21.7% in the $35,000-$49,000 group then increased to 23.0% in the highest income group.



Overweight* All respondents 18 and older who report that their Body Mass Index (BMI) is between 25.0 and 29.9. BMI is defined as weight in kilograms divided by height in meters squared (w/h**2).
Obese * All respondents 18 and older who report that their Body Mass Index (BMI) is 30.0 or more.

Physical Activity

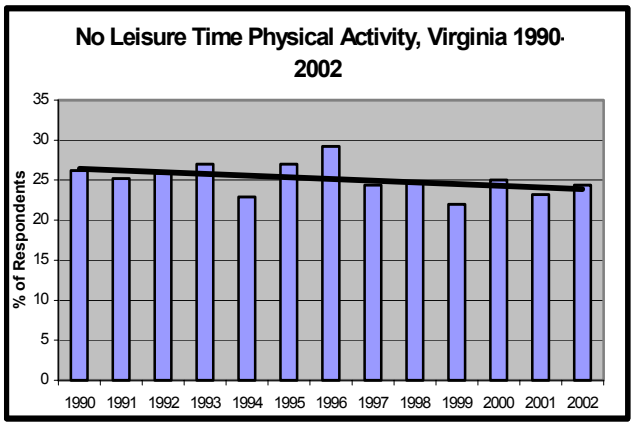
People who are not physically active can have twice the risk for heart disease than those who are active. Exercise helps prevent the development of diabetes, helps prevent overweight and obesity, and reduces hypertension - all independent risk factors for CVD. Regular physical activity can also help protect against a first cardiac episode, help patients' recovery from coronary surgeries, and may reduce the risk of recurrent cardiac events. Virginia BRFSS data for 2002 show that:

- 24.4% of respondents were physically *inactive* and did not participate in any leisure time activity in the last 30 days.
- A significantly higher proportion of females (28.3%) than males (20.2%) reported no physical activity.
- The prevalence of no physical activity fluctuated between age groups:

18-24	15.0%
25-34	24.8%
35-44	19.6%
45-54	23.9%
55-64	29.0%
65 Plus	36.5%

- The rate of no physical activity was higher among blacks (35.7%) than among whites (21.5%).

- The lack of physical activity decreased with increasing education level, from 48.9% among those with less than a high school education to 13.1% among those with a college education.
- Likewise, the lack of physical activity decreased with increasing annual household income level, from 48.9% among those in the less than $15,000 group to 13.1% in the $50,000 plus group.

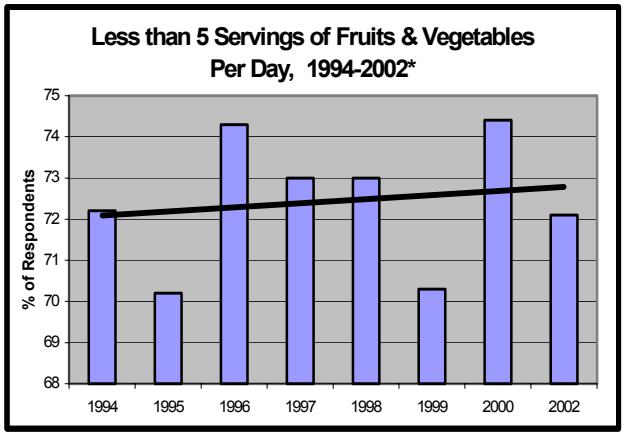


Nutrition

A diet high in fat and low in fruits and vegetables, fiber, and complex carbohydrates is a direct contributor to CVD. Such a diet can cause the development of several CVD risk factors, particularly hypertension, high blood cholesterol, overweight, and diabetes. Eating a diet high in fruits and vegetables may reduce the risk of heart disease by 20-40%. Although the number of Virginians that eat less than the recommended amount of fruits and vegetables is decreasing, the number is nominal – a 2% decrease between 2000 and 2002. Additionally, 2002 Virginia BRFSS data show that:

- A significantly higher proportion of males (75.4%) than females (68.8%) ate less than the recommended amount.
- The rate of inadequate fruit and vegetable consumption was higher among blacks (76%) than among whites (72.3%).
- The least amount of adequate fruit and vegetable consumption came from the 25-34 age group (19.8%), and the greatest consumption rate came from the 65 plus age group (41.3%).
- The prevalence of inadequate fruit and vegetable consumption fluctuated between annual household income level:

<$15,000	29.6%
$15,000-24,999	27.4%
$25,000-34,999	21.1%
$35,000-49,999	30.0%
$50,000+	28.0%



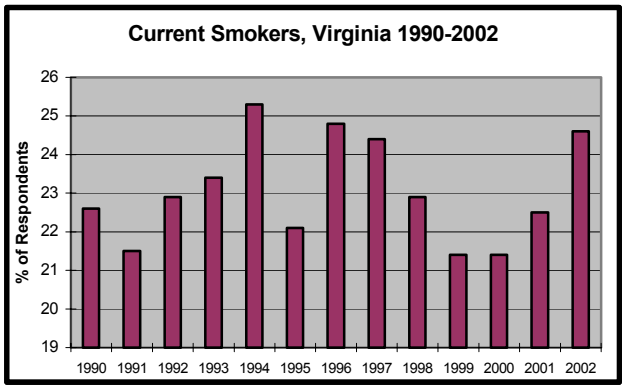
*No data collected on this measure in 2001

Tobacco Use

Smoking is the single largest preventable cause of heart disease in the United States. People who use tobacco are more likely to have heart attacks, high blood pressure, blood clots, hemorrhages, aneurysms, and other disorders of the cardiovascular system. Smokers have twice the risk for heart attack as nonsmokers, and smokers who have a heart attack are more likely to die, and die suddenly, than are nonsmokers. Cigarette smoking is also a major cause of stroke (increases clotting factors in the blood, decreases HDL cholesterol levels, increases triglyceride levels, and damages the lining of blood vessels) and the risk for stroke increases as the number of cigarettes smoked increases. Nearly one-fifth of all deaths from CVD in the United States, or about 190,000 deaths a year, are smoking-related. In 1999, 54 of 100,000 people in Virginia died due to smoking-attributable CHD.

BRFSS trend data show that cigarette use in Virginia, which had been decreasing since 1996 and leveled off in 1999 and 2000, began to increase in 2001. This opposes the national trend that shows cigarette use increasing from 1999-2000 but decreasing in 2001. Virginia BRFSS data for 2002 show that:

- 28.7% of male respondents were current smokers and 20.8% of female respondents were current smokers.
- A higher proportion of whites (24.6%) than blacks (19.7%) were current smokers.
- The prevalence was greatest among respondents in the 18-24 age group (31.6%) and lowest in the 65 and up age group (10.2%).
- A significantly greater number of respondents were in the <$15,000 income level (32.3%) than in the $50,000 plus income level (19.2%).



Diabetes

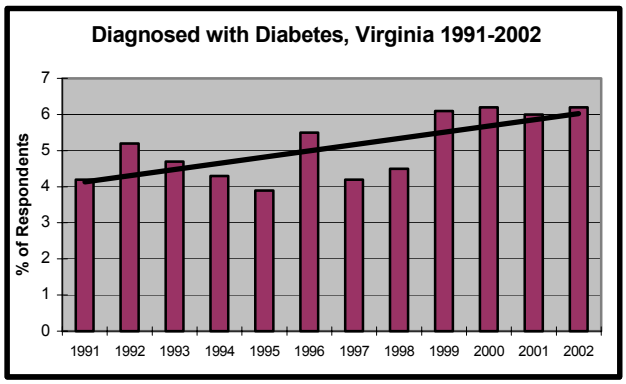
Diabetes is classified as a coronary heart disease risk equivalent - it carries a risk for heart disease *equal to someone who already has the experienced a CVD event such as a heart attack or stroke*. People with diabetes are at greater risk than people without diabetes for developing CVD, according to their prevalence of certain risk factors. In years 2001-2003, Virginians with diabetes were:

- Almost 1.5 times more likely to be obese as people without diabetes.
- Twice as likely to have high cholesterol.
- Almost 3.0 times more likely to suffer from hypertension.
- More likely to lead sedentary lifestyles.

And, in Virginia in 2001-2003 prevalence rates for persons having diabetes were:

- 6.0% for whites and 9.8% for blacks.
- 4.8% for adults aged 18 to 64 as compared to 15.6% for adults aged 65 and older.

In 2003, an estimated 7.2%, or 531,816, adult Virginians had diagnosed diabetes. In the same year, it is estimated that another 1.8%, or 132,954, had undiagnosed diabetes. As shown by the trendline in the chart below, the prevalence of diagnosed diabetes is increasing in Virginia.



Heart Attack and Stroke Module

Virginians need to be educated about the signs and symptoms of heart attacks and stroke and the importance of calling 9-1-1 quickly. Nearly 70% of deaths from heart disease occur before a person can be admitted to a hospital, and about 48% of stroke victims die before emergency medical personnel arrive.

In 2002, participants in the Behavioral Risk Factor Surveillance Survey responded to the following Heart Attack and Stroke Module questions (all responses reflect weighted percents).

Which of the following do you think is a symptom of a heart attack?

Pain or discomfort in the jaw, neck, or back			
51.17%	32.91%	15.85%	0.06%
Yes	No	Don't Know/Not Sure	Refused

Feeling weak lightheaded or faint			
63.69%	21.61%	14.69%	0.02%
Yes	No	Don't Know/Not Sure	Refused

Chest pain or discomfort			
95.44%	1.82%	2.73%%	0.02%
Yes	No	Don't Know/Not Sure	Refused

Sudden trouble seeing in one or both eyes			
35.09%	38.79%	26.10%	0.02%
Yes	No	Don't Know/Not Sure	Refused

Pain or discomfort in the arms or shoulder			
88.61%	6.44%	4.95%	
Yes	No	Don't Know/Not Sure	Refused

Shortness of breath			
89.16%	5.34%	5.49%	0.01%
Yes	No	Don't Know/Not Sure	Refused

Which of the following do you think is a symptom of a stroke?

Sudden confusion or trouble speaking			
87.96%	3.75%	8.26%	0.03%
Yes	No	Don't Know/Not Sure	Refused

Sudden numbness or weakness of face, arm, or leg, especially on one side			
94.61%	2.07%	3.32%	
Yes	No	Don't Know/Not Sure	Refused

Sudden trouble seeing in one or both eyes			
69.53%	7.97%	22.47%	0.03%
Yes	No	Don't Know/Not Sure	Refused

Sudden chest pain or discomfort			
38.81%	34.05%	27.14%	0.00%
Yes	No	Don't Know/Not Sure	Refused

Sudden trouble walking, dizziness, or loss of balance			
85.83%	5.03%	9.12%	0.02%
Yes	No	Don't Know/Not Sure	Refused

Severe headache with no known cause			
63.23%	13.85%	22.93%	
Yes	No	Don't Know/Not Sure	Refused

If you thought someone was having a heart attack or stroke, what is the first thing you would do?

Take them to the hospital	6.08%
Tell them to call their doctor	1.15%
Call 911	86.44%
Call their spouse or a family member	0.48%
Do something else	5.48%
Don't know/Not sure	0.37%

Cardiovascular Module

In 2002, participants in the Behavioral Risk Factor Surveillance Survey responded to the following Cardiovascular Module questions (all responses reflect weighted percents).

To lower your risk of developing heart disease or stroke are you:

Eating fewer high fat or cholesterol foods			
65.70 %	30.95 %	3.34%	0.01%
Yes	No	Don't Know/Not Sure	Refused

Eating more fruits and vegetables			
70.41 %	28.28 %	1.3%	0.01%
Yes	No	Don't Know/Not Sure	Refused

More physically active			
64.05 %	34.43 %	1.51%%	0.01%
Yes	No	Don't Know/Not Sure	Refused

Within the past 12 months, has a doctor, nurse, or other health professional told you to:

Eat fewer high fat or cholesterol foods			
22.20 %	77.38	0.42%	
Yes	No	Don't Know/Not Sure	Refused

Be more physically active			
64.05 %	34.43 %	1.51%%	0.01%
Yes	No	Don't Know/Not Sure	Refused

Has a doctor, nurse or other health professional ever told you that you had any of the following:

A heart attack, also called myocardial infarction			
3.30%	96.5%	0.16%	0.04%
Yes	No	Don't Know/Not Sure	Refused

Angina or coronary heart disease			
3.73%	95.67 %	0.59%	0.01%
Yes	No	Don't Know/Not Sure	Refused

A stroke			
2.04%	97.86 %	0.09%	0.01%
Yes	No	Don't Know/Not Sure	Refused

Do you take aspirin daily or every other day?

30.35 %	69.53 %	0.09%	0.03%
Yes	No	Don't Know/Not Sure	Refused

At what age did you have your first heart attack?

40 or less	18.77%
41 – 54	31.86%
55 – 64	21.71%
65 or older	14.47%
Don't know/Not sure	11.88%
Refused	1.31%

At what age did you have your first stroke?

40 or less	25.7%
41 – 54	15.04%
55 – 64	15.02%
65 or older	30.00%
Don't know/Not sure	14.23%

After you left the hospital following your heart attack or stroke did you go to any kind of outpatient rehabilitation?

31.61%	66.35%	1.74%	0.30%
Yes	No	Don't Know/Not Sure	Refused

Do you have a health problem or condition that makes taking aspirin unsafe for you? If yes, is this a stomach condition?

Yes, not stomach related	7.09%
Yes, stomach problems	8.27%
No	83.95%
Don't know/Not sure	0.64%
Refused	0.05%

Why do you take aspirin?

To relieve pain			
21.71%	77.23%	1.06%	
Yes	No	Don't Know/Not Sure	

To reduce the chance of heart attack			
83.79%	15.05%	1.08%	0.07%
Yes	No	Don't Know/Not Sure	Refused

To reduce the chance of a stroke			
65.20%	26.27%	8.53%	
Yes	No	Don't Know/Not Sure	

Priority Populations

Although CVD is a major concern throughout the state of Virginia, there are high risk and vulnerable populations that appear to be affected disproportionately and may be underserved.

Minorities

Nationally, minority and low-income populations have a disproportionate burden of death and disability from CVD. In 2000, rates of death from diseases of the heart were 29% higher among black adults than among white adults, and death rates from stroke were 40% higher.[4] Blacks have almost twice the risk of first-ever stroke compared with whites.[4]

Virginia 2002 age-adjusted CVD mortality rates are significantly higher for blacks (384.4) than whites (295.3). Between 1991 and 2001, age-adjusted CVD mortality rates improved 18% for blacks and 20% for whites.

The 2001 black life expectancy (72.8 years) in Virginia was less than the average white life span (78.06 years) by more than 5 years. Compared with whites, blacks are much more likely to have high blood pressure, less likely to engage in physical activity, more likely to be overweight or obese, and more likely to have diabetes.[5] All these factors significantly increase the risk of developing cardiovascular disease.

Children

Targeting obesity in childhood can impact and prevent adult obesity - the more severe and earlier the onset of obesity in childhood, the more severe the adult obesity and the earlier the onset of obesity-related co-morbidities.[6] The proportion of overweight children in the United States has tripled since 1980. Results from the 1999-2002 National Health and Nutrition Examination Survey (NHANES) indicate that an estimated 16% of children and adolescents ages 6-19 years are overweight.

In Virginia, a 2003 survey[7] of twelve fourth grade classes showed:

- 28% of the children were overweight.
- About 95% reported watching TV daily.
- 74% reported playing video games, with the majority of children playing games for one to two hours daily.

Women

CVD, particularly coronary heart disease and stroke, remains the leading killer of women in America. One in five females have some form of cardiovascular disease and the number of CVD deaths for females has exceeded those for males since 1984. Women under age 50 who suffer heart attacks are twice as likely to die from them as men in the same age group, and CVD ranks first among all disease categories in hospital discharges for women.[8] In Virginia:

- The rate of CVD decline in Virginia is less for women than men - between 1995 and 2002 the number of CVD deaths decreased 6% for men but only about 1% for women.
- Major cardiovascular disease claimed the lives of 10,754 females in 2002 while 5,066 females died from all forms of cancer combined.
- 4,528 women died from CHD in 2002 while 2,689 died from breast and lung cancer combined.
- 52% of 2002 CVD hospital discharges were attributable to women.
- In a study conducted by the CDC and West Virginia University, the heart disease mortality rate for Virginia women aged 35 and above in 1991-1995 ranked *41st out of 50 states*.
- In 2002, there were 10,754 CVD deaths to women and 9,372 deaths to men.
- White females had the highest non-age-adjusted CVD mortality rate in 2002 at 306.7 per 100,000 population, followed secondly by black females at 282.3.

Inadequate Health Care Access

More than one million Virginians do not have access to the primary health care they need. For many, the cost is simply too high. In 2001, 14.9% of all Virginians were uninsured — 1,051,235 men, women and children. The estimated number of uninsured has increased by nearly 300,000 people since 1996. Compared to those with private insurance, the uninsured are substantially more likely to forego needed medical care, prescriptions, and dental care. According to a survey by the Virginia Health Care Foundation, in 2001:

- One half of Virginia's uninsured had incomes below 200% of poverty and many of the uninsured (67%) are working fulltime.
- Racial and ethnic minorities are at greater risk of being uninsured - an estimated 37% of the uninsured are black or other minority.
- An estimated 22% of the uninsured are children, 77% are age 18-64, and 1% are age 65+.

Inadequate income and insurance are only part of the problem for underserved Virginians. From remote counties and towns, to the impoverished inner cities, many Virginia communities do not have the number of primary care physicians and other healthcare providers necessary to meet the medical needs of the population. The Southwest Region of Virginia has the highest mortality rates for all major cardiovascular diseases combined, as well as for diseases of the heart and cerebrovascular disease. The Southwest is also the most medically underserved region of the state.

The Need for Prevention

Cardiovascular diseases are projected to increase sharply in numbers as the nations "baby boom" generation ages, but CVD can be avoided and successfully treated. Therefore, it is critically important to educate people about risk factors and lifestyle changes that can reduce their risk.

Individually, people can reduce their risk of CVD by avoiding tobacco use, adopting healthier diets, being physically active, and having regular blood pressure and cholesterol screenings. At-risk populations can also benefit from physician counseling and the use of various medications as administered under a clinician's care. Even after a heart attack or stroke, steps can be taken to lower the risk of another event. Adults who have been diagnosed with cardiovascular disease can reduce their risk for death and disability by adhering to treatment for high blood pressure and cholesterol, and learning the symptoms of heart attack and stroke.

Many effective cardiovascular prevention measures can come from community organizations such as religious institutions, businesses, schools, social service programs, hospitals, clinics, community groups, and unions. Local organizations are valuable because of their influence, their resources, and their involvement in the community. They can support needed public health actions and mobilize resources to help implement healthy changes.

The national prevention agenda for the nation, *Healthy People 2010,* includes heart disease and stroke in a comprehensive set of disease prevention and health promotion objectives. *Healthy People 2010* is comprised of a wide range of public health priorities and specific, measurable objectives, which will increase quality and years of healthy life and eliminate national health disparities over the first decade of the 21st Century. Additionally, state population-based intervention programs, like the Cardiovascular Health Project, are committed to prevention policy and action. The programs educate churches about the importance of cooking healthy meals for church events. The programs also coordinate with local partners to upgrade sidewalks, install bicycle lanes and increase access to recreation areas.

Individual Prevention:

- Follow the U.S. Department of Agriculture's Dietary Guidelines for healthy eating (see www.health.gov/dietaryguidelines).
- Build physical activity into a daily routine. Accumulate at least 30 minutes of activity most days of the week by walking part way to work or taking the stairs.
- Eat smaller portions at mealtime.
- Drink more low-fat milk, and water instead of soda.
- Eat five servings of fruits and vegetables a day. They can be fresh, frozen, low salt, dried or juice. Serving sizes are one-half cup vegetables or fruit, a medium piece of fresh fruit, a cup of chopped raw, leafy vegetables, six ounces of 100% fruit or vegetable juice, one-half cup of beans or peas or one-quarter cup dried fruit.
- Eat more fiber, which is found in fruits, vegetables and whole grains.
- Reduce the amount of time children spend watching TV or playing video games and encourage more physical activity.
- Plan family and school activities that provide exercise and enjoyment.

Community Prevention:

- Encourage more physical education programs in school.
- Support activities to limit the availability of high-calorie foods in school and work site vending machines.
- Promote the creation of environments that support healthy eating and physical activity, such as sidewalks, bike paths and walking trails.
- Increase awareness of the warning signs of heart attack and stroke, and the need to call 9-1-1 immediately.
- Promote CPR and AED training.
- Provide placement of AED's in public sites.

References

1. National Diabetes Education Program, "The Link Between Diabetes and Cardiovascular Disease": http://www.ndep.nih.gov/control/CVD.htm.

2. Office of Minority Health, "Closing the Gap", September/October 2002: http://www.omhrc.gov/ctg/ctg-Oct-2002.pdf.

3. Virginia Department of Health Diabetes Control Project, "Diabetes in Virginia, 2002": http://www.vahealth.org/diabetes/Diabetes in VA_2002.pdf, and Virginia Commonwealth University, Survey and Evaluation Research Laboratory, "Diabetes: Findings from Virginia's BRFSS, 2001-2003".

4. American Heart Association, "Heart Facts 2003: African Americans, Cardiovascular Diseases Still No. 1": http://www.americanheart.org/downloadable/heart/1046365800849HFAAFS.pdf.

5. National Center for Health Statistics (NCHS), "Health, United States, 2002."

6. Whitaker RC, Wright JA, Pepe MS, Seidel KD and Dietz WH. "Predicting Obesity in Young Adulthood from Childhood and Parental Obesity." *NEJM* 1997;337(13): 869-873.

7. Virginia Department of Health, "An Examination of Healthy Behaviors in Virginia's Children, 2003. "

8. American Heart Association, "Biostatistical Fact Sheet – Populations: Women and Cardiovascular Diseases": http://www.americanheart.org/downloadable/heart/1014997177381FS10WM02WEB.pdf.

Data Sources

Behavioral Risk Factor Surveillance System (BRFSS)
BRFSS is a state-level annual phone survey of un-institutionalized adults (18 years or older). The information is used to estimate prevalence of chronic disease, health status, and related risk factors, as baseline data, and for evaluation of large-scale health programs: www.cdc.gov/brfss.

Virginia Department of Health, Center for Health Statistics (VCHS)
VCHS collects, analyzes and disseminates population-based health data. Data is collected via vital records, through the use of surveys, and by partnerships with other public and private entities, such as the United States Census Bureau:

http://www.vdh.state.va.us/HealthStats/.

Virginia Health Information Discharge Dataset (VHI)
VHI provides a dataset of every hospital discharge in Virginia. The dataset describes medical care by specific disease or procedure, calculates trends in cost and length of stay, and calculates annual expenditures for specific diagnoses or procedures: www.vhi.org.

Methods

ICD Categories
Major Cardiovascular Disease: ICD/9 390-448, ICD/10 I00-I78

Coronary Heart Disease: ICD/9 codes 410-414 and ICD/10 codes I20–I25

Diseases of the Heart: ICD/9 390-398, 402, 404-429 and ICD/10 I00-I09, I11, I13, I20-I51

Stroke: ICD/9 430-438, ICD/10 I60-I69

Age-Adjusted Death Rate
Age-adjusted death rates minimize the distortions created by differences in age distribution in a standard population and are used to compare death rates from different populations or in the same population over time.

Prevalence and Prevalence Rate
Prevalence is defined as the number of individuals with a disease or condition at a specified time divided by the number of individuals in the population at that time. In this report, the prevalence rate is often expressed as a proportion, either as cases per 100,000 people, or as a percentage (cases per 100 people).

Incidence and Cumulative Incidence
Incidence is the number of new cases occurring in a specified period of time. For example, new cases may be defined by initial diagnosis in the preceding year. Cumulative incidence is the number of new cases of a given disease or condition identified in a population during a specified period of time divided by the number of people at risk in that population. In this report cumulative incidence is expressed as cases per 100,000 people, or as a percentage (cases per 100 people), during the time period specified.